

WE CLAIM:

1. An extended release matrix tablet for oral administration comprising one or more active pharmaceutical ingredients, a water swellable cellulose derivative, an alginic acid derivative and a cationic polymer.
2. The extended release matrix tablet according to claim 1, wherein the water swellable cellulose derivative comprises one or more of hydroxypropyl methylcellulose, hydroxypropyl cellulose, methylcellulose, carboxy methylcellulose, hydroxy methylcellulose, and hydroxy ethylcellulose.
3. The extended release matrix tablet according to claim 2, wherein the water swellable cellulose derivative comprises hydroxypropyl methylcellulose.
4. The extended release matrix tablet according to claim 2, wherein the water swellable cellulose derivative comprises hydroxypropyl cellulose.
5. The extended release matrix tablet according to claim 1, wherein the alginic acid derivative comprises one or more of alginic acid and its physiologically acceptable salts.
6. The extended release matrix tablet according to claim 5, wherein the physiologically acceptable alginic acid salts comprise one or more of sodium, potassium, calcium and magnesium salts of alginic acid.
7. The extended release matrix tablet according to claim 6, wherein the physiologically acceptable alginic acid salt comprises sodium alginate.
8. The extended release matrix tablet according to claim 1, wherein the cationic polymer comprises a methacrylic acid derivative with a dimethylaminoethyl ammonium group.
9. The extended release matrix tablet according to claim 8, wherein the methacrylic acid derivative with a dimethylaminoethyl ammonium group comprises Eudragit® E 100.
10. The extended release matrix tablet according to claim 8, wherein the methacrylic acid derivative with a dimethylaminoethyl ammonium group comprises Eudragit® EPO.
11. The extended release matrix tablet according to claim 1, wherein the extended release matrix comprises from about 10% to about 80% by weight of the total formulation.

12. The extended release matrix tablet according to claim 1, wherein the water swellable cellulose polymer comprises from about 10% to about 50% by weight of the total formulation.
13. The extended release matrix tablet according to claim 1, wherein the alginic acid derivative comprises from about 0.1% to about 15% by weight of the total formulation.
14. The extended release matrix tablet according to claim 1, wherein the cationic polymer comprises from about 0.1% to about 15% by weight of the total formulation.
15. The extended release matrix tablet according to claim 1, wherein the active pharmaceutical ingredient comprises one or more of antibiotics, sympathomimetics, sympatholytic agents, cholinergic agents, antimuscarinics, gastro-intestinal drugs, gentio-urinary smooth muscle relaxants, cardiac drugs, anticonvulsants, tranquilizers and sedatives.
16. The extended release matrix tablet according to claim 15, wherein the active pharmaceutical ingredient comprises an antibiotic.
17. The extended release matrix tablet according to claim 16, wherein the antibiotic comprises cefaclor.
18. The extended release matrix tablet according to claim 15, wherein the active pharmaceutical ingredient comprises a sympatholytic agent.
19. The extended release matrix tablet according to claim 18, wherein the sympatholytic agent comprises carvedilol.
20. The extended release matrix tablet according to claim 1, wherein the tablet additionally contains other pharmaceutically inert excipients.
21. The extended release matrix tablet according to claim 20, wherein the other pharmaceutically inert excipients comprises one or more of binders, diluents, lubricants, glidants and colors.
22. The extended release matrix tablets according to claim 21, wherein the binders comprise one or more of methyl cellulose, hydroxypropyl cellulose, hydroxypropyl methylcellulose, polyvinylpyrrolidone, gelatin, gum arabic, ethyl cellulose, polyvinyl alcohol, pullulan, pregelatinized starch, agar, tragacanth, sodium alginate and propylene glycol.

23. The extended release matrix tablets according to claim 21, wherein the diluents comprise one or more of calcium carbonate, calcium phosphate-dibasic, calcium phosphate-tribasic, calcium sulfate, cellulose-microcrystalline, cellulose powdered, dextrans, dextrans, dextrose excipients, fructose, kaolin, lactitol, lactose, mannitol, sorbitol, starch, starch pregelatinized, sucrose, sugar compressible, sugar confectioners and mixtures thereof.
24. The extended release tablets according to claim 21, wherein the lubricants and glidants comprise one or more of colloidal anhydrous silica, stearic acid, magnesium stearate, calcium stearate, talc, hydrogenated castor oil, sucrose esters of fatty acid, microcrystalline wax, yellow beeswax and white beeswax.
25. The extended release tablets according to claim 21, wherein the tablets further comprise a coating.
26. The extended release tablets according to claim 1, wherein between 80% and 100% of the one or more active pharmaceutical ingredients in the extended release tablet is released over approximately eight hours in both an acidic environment of approximately 0.1N HCl and a near neutral environment of approximately pH 6.8.
27. A process for preparing extended release matrix tablets comprising one or more water swellable cellulose derivatives, one or more alginic acid derivatives and one or more cationic polymers, the process comprising:
dry blending the one or more water swellable cellulose derivatives, the one or more alginic acid derivatives, and the one or more cationic polymers together to form a blend.
28. The process of claim 27, wherein the blend further comprises one or more active pharmaceutical ingredients.
29. The process of claim 28, further comprising:
dry granulating the blend to form granules; and
compressing the granules to form tablets.
30. The process of claim 28, further comprising:
wet granulating the blend to form wet granules;
drying and sizing the wet granules; and
compressing the granules to form tablets.
31. The process of claim 27, wherein the blend further comprises one or more diluents.

32. The process of claim 31, further comprising:
incorporating one or more active pharmaceutical ingredients into the blend in
geometric progression;
mixing with lubricant and glidants; and
directly compressing into tablets.
33. The process of claim 27, wherein the water swellable cellulose derivative comprises
one or more of hydroxypropyl methylcellulose, hydroxypropyl cellulose,
methylcellulose, carboxy methylcellulose, hydroxy methylcellulose, and hydroxy
ethylcellulose.
34. The process of claim 27, wherein the alginic acid derivative comprises one or more
of alginic acid and its physiologically acceptable salts.
35. The process of claim 27, wherein the cationic polymer comprises a methacrylic acid
derivative with a dimethylaminoethyl ammonium group.
36. The process of claim 29, wherein between 80% and 100% of the active
pharmaceutical ingredient in the extended release matrix tablet is released over
approximately eight hours in both an acidic environment of approximately 0.1N HCl
and a near neutral environment of approximately pH 6.8.
37. A method of treating a medical condition in need of pharmaceutical treatment, the
method comprising orally administering an extended release matrix tablet
comprising:
one or more water swellable cellulose derivatives, one or more alginic acid
derivatives and one or more cationic polymers; and
one or more pharmaceutically active ingredients suitable for treatment of the
medical condition for which the tablet is orally administered.
38. The method of claim 37, wherein the water swellable cellulose derivative comprises
one or more of hydroxypropyl methylcellulose, hydroxypropyl cellulose,
methylcellulose, carboxy methylcellulose, hydroxy methylcellulose, and hydroxy
ethylcellulose.
39. The method of claim 37, wherein the alginic acid derivative comprises one or more
of alginic acid and its physiologically acceptable salts.
40. The method of claim 37, wherein the cationic polymer comprises a methacrylic acid
derivative with a dimethylaminoethyl ammonium group.
41. The method of claim 37, wherein the medical condition comprises one or more
conditions for which one or more of an antibiotic agent, a sympathomimetic agent, a

sympatholytic agent, a cholinergic agent, an antimuscarinic agent, a gastro-intestinal drug, a gentio-urinary smooth muscle relaxant agent, a cardiac drug, an anticonvulsant agent, a tranquilizing agent and a sedative are suitable.

42. The method of claim 37, wherein between 80% and 100% of the active pharmaceutical ingredient in the extended release tablet is released over approximately eight hours in both an acidic environment of approximately 0.1N HCl and a near neutral environment of approximately pH 6.8.
43. An extended release matrix tablet for oral administration comprising one or more active pharmaceutical ingredients and an extended release matrix, wherein
- the extended release matrix comprises between about 10% to about 50% by weight of the total formulation of a water swellable cellulose derivative, between 0.1% to about 15% by weight of the total formulation of an alginic acid derivative, and between 0.1% to about 15% by weight of the total formulation of a methacrylic acid derivative with a dimethylaminoethyl ammonium group;
 - the active ingredient comprises one or more of antibiotic agents, sympathomimetic agents, sympatholytic agents, cholinergic agents, antimuscarinics, gastro-intestinal drugs, gentio-urinary smooth muscle relaxants, cardiac drugs, anticonvulsant agents, tranquilizers and sedatives; and
 - between 80% and 100% of the active pharmaceutical ingredient in the extended release tablet is released over approximately eight hours in both an acidic environment of approximately 0.1N HCl and a near neutral environment of approximately pH 6.8.